



## CHAPTER 9

# MAINTENANCE





**T**he objectives of trail maintenance are to provide for user safety, access, and convenience, protect adjacent resources, and preserve trail investment. Maintenance begins immediately following trail construction and is a continuous process.

Sometimes questions arise whether seldom-used stretches of trail are worth the time and effort required to maintain them. This is one of those conundrums. If a trail segment is not maintained, people will not hike it because they probably cannot find it. There is also a responsibility to provide the public with what we are advertising—a quality National Scenic Trail experience. All trail should be maintained in the best condition possible—a well-maintained trail guarantees its use and helps ensure its future support.

## **TRAIL ASSESSMENT AND INVENTORY**

### **Trail Assessment**

One way to document maintenance needs, or to just provide information on the condition of the trail, is through the use of a trail assessment or inventory form (see Appendix 3). For routine maintenance, a detailed trail condition assessment may not be necessary. However, there may be sections of the trail where it is not possible to complete all maintenance immediately or where more help in terms of labor and/or money is needed. For example, during a routine walk-through, a severely eroded, lengthy trail section may be noted. Since the best solution for a severely eroded trail section may be to relocate it, the work is not within the capabilities of an individual maintainer to correct immediately. In that case an assessment is needed so that the major needs can be relayed to the local managing authority and the NPS. With this information in hand, funding or labor can be committed to assist in correcting the problem. A maintenance assessment can also serve as a basis for applying for Challenge Cost Share funds.

### **Inventory**

A more detailed inventory of trail features and required maintenance is desirable as the trail moves closer to completion, trail managers become more knowledgeable, and the partnership (NPS, WDNR, and IAPTF) increases management oversight capability. An electronic database is capable of generating various reports, including maintenance needs, utilizing the proposed Ice Age NST Trail Inventory and Assessment Process. It is beyond the scope of this handbook to develop a database format or require the various local trail managing authorities to use it. This level of detail should be implemented someday. If current managing authorities desire a detailed inventory, they are encouraged to proceed, keeping in mind that the selected format and the computer software should be compatible with other authorities and their software programs.

There are two ways to collect data for this type of database:

**Paper Forms** - Persons using this method walk the trail and enter the data on a series of forms. The data from the forms is then manually typed into the electronic database back in the office.



**GPS/GIS** - Persons using this method walk the trail with a Global Positioning System (GPS) unit, keying in the data points and mapping the trail as they go. Back in the office, data from the GPS unit is downloaded to a computer and processed into various formats and transferred to a Geographic Information System (GIS). This method is not widely available yet. It not only provides a detailed inventory of various trail features, but also can be used to produce a very accurate trail map. Eventually, the entire trail will be mapped with this method and included in a GIS.

## MAINTENANCE ACTIVITIES

When assessing trail maintenance needs, the following groups of general maintenance categories should be considered. Some of the more common maintenance activities required to remedy deficiencies identified during the annual trail evaluation could include:

<b>Trail Maintenance-Vegetation</b> Brushing/clearing areas Remove fallen trees/branches Hazard tree removal Slope revegetation Backslope grooming Vista Maintenance Poison Ivy Removal (herbicide)	<b>Structure Maintenance</b> Bridge Repair Cribbing/retaining wall repair Barriers/guardrail repair Steps/perron repair Fence/gate/stile repair Shelter repair
<b>Tread Maintenance</b> Grading tread slough and slide removal slump repair filling erosion ditches grubbing rocks/roots/stumps Spot surfacing Turnpike section repair Surface replacement (similar material)	<b>Sign Maintenance</b> Sign repair/rehabilitation Sign replacement Blaze repairing and maintenance Caim repair Barricade/closure device repair
<b>Drainage Maintenance</b> Cleaning/Repairing Structures culverts waterbars coweeta dips drainage ditches Replacement of existing structures culverts/underdrains Install additional drainage structures waterbars culverts grade dips	<b>Litter Clean-up</b> Old dumps near trail Current discarded litter



## Trail Maintenance-Vegetation

All side branches extending into the trail clearing should be cut flush with the parent branch or stem, leaving no stubs. This is safer, lasts longer, and also allows for the wound to heal naturally.

Small trees and shrubs within the tread should be grubbed out to prevent tripping. Holes should be filled and compacted.

Trees and brush outside the tread (but inside the trail clearing) should be cut as close to the ground as possible, leaving no sharp pointed stumps or stems. Consideration may be given (especially on exotic species) to treating these cut stumps with herbicide, after obtaining proper approval.

Unless prohibited, using power mowers in open grassy areas or power brush saws in brushy areas should be considered.

In high-use sections of the trail or near camping areas, dead or dying trees that could possibly fall across the trail or camping area should be removed. In Semi-Primitive ROS areas, only those trees that may be a serious hazard to users should be removed.

### Wrong



### Right



## Tread Maintenance

When tread repair is needed, it should be restored to the original design condition, free of loose stones, rock points, stumps, and roots. Attention should be given to dips and outsloping so that water does not collect on the trail.

## Drainage Maintenance

Proper drainage protects the trail from erosion damage. Trails should be routinely inspected to ensure that all culverts, dips, waterbars, drainage ditches, etc. are free of debris and ready to function properly at all times, especially during the rainy season or spring runoff. Routine maintenance is not only necessary, but valuable in terms of labor, material, and money saved on emergency repairs, and in the number of days the trail is usable. If repairs are necessary, they should meet or exceed the original construction specifications.

## Support Structure Maintenance

The major consideration in structure maintenance is safety. Bridges, stiles, boardwalks and all support structures should be routinely inspected in order to ensure safe conditions and intended function (see bridge inspection requirement in Chapter 5). Minor maintenance of structures should be provided by the adopter or trail crew. Deficiencies requiring major efforts should be planned as a separate project. Unsafe structures must not remain unattended. If work must be temporarily deferred, an alternate trail route should provide a bypass of the hazard.



## **Sign Maintenance**

See discussion in Chapter 7.

## **FREQUENCY OF MAINTENANCE**

Most trail segments need maintenance about three times per year.

### **Prior to Memorial Day**

This may be the maintenance period that involves the most work. The objective is to get the trail ready for the spring hikers. In addition to general trail cleanup, some of the more important tasks are to:

- ▶ Remove tree limbs and fallen trees from the trail, and prune encroaching limbs as needed.
- ▶ Repaint or replace the blazes if they are faded or missing. (Be sure that they are not obscured by vegetation—consider growth that occurs before the next maintenance).
- ▶ Make sure that all signs and trail emblems are in place and well maintained.
- ▶ Inspect for water in the trail and take corrective action.
- ▶ Carefully inspect all bridges—immediate safety needs should be met and tasks which are too large for immediate action noted.
- ▶ Maintain all trailheads, campsites, and other support structures.
- ▶ Keep a list of larger jobs or those that require different tools that will require attention at some other time.
- ▶ Schedule time for major projects that were identified—round up tools and helpers.
- ▶ Pick up litter.

### **Mid-Summer**

Early July is a good time to take care of annual growth so that the trail is kept clear and relatively easy to hike. The hiker should not be assaulted by weeds and briars. Some of the key jobs for mid-summer are to:

- ▶ Mow or cut all weeds, brambles, briars, and high grass encroaching on the trail. On sections of the trail that pass through fields or other places receiving direct sunlight, mowing may have to be done on a more frequent basis. Brambles and briars may need to be grubbed out by the roots to prevent rapid regrowth.
- ▶ Prune all brush and overhanging limbs that have grown into the trail clearing—all blazes and signs must be visible.



- ▶ Complete the larger jobs that could not be accomplished in the spring.
- ▶ Maintain and improve water bars, drainage ditches, and all trail structures.
- ▶ Be alert for noxious or exotic plant species—remove, kill, or inventory them for future vegetative management projects.
- ▶ Pick up litter.

## Fall

Fall maintenance is geared toward preparing the trail for the winter months. This is a time to:

- ▶ Finish any uncompleted jobs and recheck blazes and signs—replace and repair as necessary.
- ▶ Be sure that campsites and shelters are clean and in good repair.
- ▶ Contact landowners to thank them for their support.
- ▶ Pick up litter.

## ORGANIZING THE CREW

Experience and knowledge of the trail will help determine what tools to take and how many persons to recruit. The most efficient way to manage trail crews goes by various names—the “overseer” system, the “trail sponsor” system, the “adopt-a-trail” system. The key is that one person is responsible for a particular segment of trail on a permanent basis, if possible. It is their responsibility to see that the trail segment is maintained, either working by themselves or by recruiting helpers. The advantage of this system is that the adopter becomes well acquainted with the segment, can deal efficiently with problem areas, and can judge how much and how often work is needed to keep the segment maintained. A disadvantage of this system is that a segment can become so familiar that problems are overlooked or it becomes boring for the adopter. One way to overcome this problem is to rotate adopters between segments every few years. A good reference on crew organization is the Appalachian Mountain Club’s *Organizing Outdoor Volunteers*.

The annual trail evaluation or a pre-workday trip by the adopter can serve as an assessment of the work to be done and will facilitate crew organization. Two to four persons can usually maintain 3 to 5 miles of trail per day—depending on the individuals, terrain, vegetation, and the number of maintenance problems.

The exact kind and number of tools for a crew varies from one part of the country to another. In general, tools which are capable of cutting weeds, pruning branches, removing logs, digging and leveling trail, and cleaning waterbars are desirable. It is advantageous to rotate tools among trail workers to provide relief from repetitive motion and effort (see Chapter 10 for tool suggestions).

## CLEANUP

The trail must be cleared of all debris following clearing or heavy maintenance. Maintenance results should appear neat and hardly noticeable to a hiker. Inadequate clean-up can spoil even the most



thorough clearing job. One person on the crew should be assigned responsibility for this job. All cut growth should be carried off the trail and scattered—not piled. If eroding gullies are nearby, the cut material can be placed in the gully to slow the flow of water and catch sediment.

All flagging, construction stakes and debris, litter, etc., should be removed.

## **MAINTENANCE AND CONSTRUCTION TIPS**

Work should be organized so every section of trail is left as complete and finished as possible.

Vegetation and natural debris should be re-used as much as possible. On every trail there are points where excess material must be removed and sections where material will be needed. Rock and soil removed from a cut on one section can be used as fill on another nearby section.

A trail does not have to be worked progressively from beginning to end. Priority should be given to sections needing the most attention. The cut sections may be worked first, followed by the fill areas. Water diversions should be installed prior to trail surfacing work to allow for natural drying and easier working conditions. If two crews are working along the same trail, work assignments and locations should be scheduled to allow for exchange of equipment and materials.

When constructing new trail, a short, unworked section should be left next to access roads until last—this helps eliminate premature use.

As construction and maintenance is finished on a segment, clean-up should also be completed. Postponing trailside cleanup until later is poor procedure—it seldom gets done.

Time should be taken to do the job correctly the first time around to avoid having to repeat the task.

### **Clearing**

Flagging should be used for temporary trail marking or to identify work to be done.

For light pruning work that is within reach, hand pruning shears (like those used by a gardener) are quicker and easier than long handled loppers.

A stout but flexible forked sapling (about an inch in diameter at the base) that has been cut about 4 ½ to 5 feet in length (with about a 10" fork at the end) is a very useful tool for flinging small limbs out and away from the trail. When following someone who is using a power brush saw, it is also an excellent tool for flinging the cut brush out of the trail. Used like a pitch fork, it scatters the brush so that it is not visibly concentrated, and is much more efficient than bending to pick up and discard each piece by hand.

All main stems or trunks should be cut as close to the ground as possible—or grubbed out. It is very important to avoid leaving short stubs (trippers) as they are a safety hazard. Cut hardwood stems resprout easily; therefore, grubbing is the preferred method as it is a one-time treatment.

Larger logs should be carried to the downhill side of the trail and placed perpendicular to the face of the hill to prevent them from rolling and creating a safety hazard.

If a branch needs to be pruned, it should be cut next to the trunk. If not cut next to the trunk, these



safety hazards tend to develop suckers or side branches which will have to be cut again and look unnatural. Large limbs should be undercut first to prevent peeling the bark from the main stem when the branch falls.

Conifer branches and weak trees, such as alder, are easily weighted with heavy snow or rain and may require extra clearing.

## Painting

Clean, neat ways to carry and apply paint should be practiced. The following suggestions should be considered:

- A 1" wide brush spreads wider during painting. Some prefer using a 2" brush and little pressure so that the blaze doesn't get too wide.
- To illustrate the proper blaze size, a dollar bill is very close to 2" x 6".
- Old gloves, a wire brush, and a 2 1/2" paint scraper are handy tools to bring along.
- Paint can be kept in an old, snap-top detergent pail or large-mouth screw top plastic container. Applying small amounts of paint to the brush can ensure a neater job.
- A painted wooden box 11" x 13" x 1/4" plywood, with raised ends for handles, is a convenient way for one person to carry supplies. These supplies may include several colors of paint (yellow, brown, bark, blue) and wash water, as well as nails, hammer, lagbolts, wrench and brushes. A plastic bag can be attached to carry paper towels and plastic bags.
- Extra plastic bags kept in the vehicle are handy. Brushes can be wrapped in plastic so they won't dry out until cleaned back at the trailhead or home. Bring along water and detergent to clean the brushes. An old gallon milk container is a good way to carry extra water.

## Signs

When using Carsonite posts, the optional anchor at the bottom should always be installed. This makes them even harder for vandals to remove from the ground while adding little expense.

When installing wooden posts, a piece of scrap lumber should be nailed to the lower part of the post. It is easier to nail it parallel to the post—this method is just as effective as a perpendicular arrangement and allows for a smaller post hole.